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ABSTRACT

The role of the right hemisphere of the brain in learning is examined, and the possibility of using visuals to improve verbal learning in right brain dominant learning disabled students is suggested. Approaches to stimulate oral language production, aid in the recall of written language, and achieve organizational style in writing through arranging visuals in a sequence of pictures are discussed. Transition words and elements are said to help students form continuity between ideas. It is explained that teachers can arrange visuals to achieve three general organizational patterns in writing: sequential, descriptive, and comparative/contrastive. Ideas for promoting each of the three general organizational patterns are given. (CL)

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TITLE: Visual Literacy: A Concrete Language For The Learning Disabled

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Visual Literacy: A Concrete Language For The Learning Disabled

Few programs or specific methodologies have capitalized on skills developed easily by learning disabled children - - the skills of naming, sequencing, and organizing things visually. These skills, developed gradually from birth through interaction with the environment, have been further nurtured by television and other audiovisual communication sources, pictures, signs, slides, cartoons, drawings, etc. Youngsters are used to receiving messages in a sequence of pictures and have developed the ability to translate from the visual language to the verbal and vice versa (Fransecky and Debes, 1972). Furthermore, the development of visual literacy competencies including the discrimination and interpretation of visible actions, objects, and symbols, are fundamental to normal human learning. However, when learning disabled children are singled out for special treatment in reading and writing improvement, which also involves mastery of sequential, orderly learning, the use of picture stimuli are often dropped from their curriculum. If teachers become aware that a child's talents lie in the use of visual-spatial skills, a conceptual problem may be solved according to that mode of preference, reducing discouragement and subsequent hostility towards the learning process (Gazzaniga, 1975).

Some unique personal histories come to mind of students who were quite adept in the visual-spatial area. Frank, a 27 year old, auto body methanic, was found to be a non-reader, functioning below the first grade level in reading. His WAIS was in the average range of intellectual functioning and a neurological evaluation suggested that his problem was

visual agnosia. However, Frank's specialty in auto body work was rewiring burned-out cars. His partner would direct Frank to the proper pages in auto manuals which showed maps of cars' wiring systems. Milton, a 7th grader, received report card ratings of "D" and "F" in reading, spelling, and handwriting when he completed the sixth grade year. However, he performed at the 99th percentile in intellectual functioning on the WISC and astounded his 7th grade teachers when he constructed a large scale model of a chemically complicated molecule for a science project. Keith, a 9th grader measured at the bright/normal range of intellectual functioning, has been struggling in language arts activities since first grade. He labors to recall the correct spellings and kinesthetic orientation of words to complete composition assignments. Yet, in a section of his basement lie five engine-powered model airplanes built to scale, two gasoline-powered mini bikes needing repair, and an English racing bike in stages of reconstruction. How can these obviously talented people be specialists in some areas, yet considered to be "failures" by school standards?

The Brain's Role in Processing Information

To answer this question, we must examine what recent research has found regarding the brain's role in the processing of different types of stimuli and the contribution of each brain hemisphere to learning. Each hemisphere appears to react differently to the information presented to it. For most people, the left hemisphere processes stimuli serially, performing in a logical, analytic way by abstracting out relevent details and attaching verbal labels (Willis, et al., 1979). Witelson concluded that the mediation of phonemic discrimination, speech production, and general language functions, partly constitute left hemispheric specialization in childhood (1977).

The right hemisphere's mode of perception is primarily holistic. The right hemisphere is primarily a synthesizer ,processing many stimuli at a time, and is more concerned with the total stimulus configuration, which is organized and processed as a whole or Gestalt (Harris, 1976). It is superior for kinesthetic, auditory, and visual perceptions not related to language (Fox, 1979). Thus, while the left hemisphere functions to pick apart and reform words and sentences, the right hemisphere focuses on shapes, configurations, and visual-spatial associations.

Students will differ in the way they perform various tasks depending upon how information is processed in the dominant hemisphere. Those who perform better at verbal and language-related tasks may be considered to be left dominant. Those who seem to perform better at visual-spatial tasks for which the right hemisphere is organized may be considered to be right dominant. Right dominants show high interest in visual stimuli and are addicted television watchers, finding cartoons, science fiction, and vivid visual programs a highly motivating and satisfying experience (Fadley and Hosler, 1979). Furthermore, the ability to think in visual images is apparently associated with right hemispheric functioning and may be the recall strategy of right hemisphere dominants (Coleman and Zenhausern, 1979).

Schools do not seem to reward and encourage right brain-dominant children. The many school activities dominated by reading and writing participation are channeled through left-brained input and output systems. Children who may learn better through right-brained input are conditioned to use their left brains without opportunities to process the same information through the more dominant hemisphere (Hunter, 1977).

Furthermore, it is to these right brain-dominant children that the labels "slow," "incapable," or "learning disabled" may be attached.

Focus on Hemispheric Specialization

Traditionally, reading and learning disabled children have been found to be deficient in both the storage and retrieval of printed and spoken words (Vellutino, 1977). Furthermore, disabled readers who have difficulty processing written symbols may not have the same hemispheric specialization for language functions as do normal readers. Pirozzolo and Rayner (1979) presented words and facial photographs to the left and right hemispheres of disabled readers characterized as auditory-linguistic dyslexics. Their results replicated earlier findings in that poor readers showed intact right hemispheric processing for facial recognition but exhibited no laterality preference for word recognition. They suggested that the processing of linguistic information in the left hemispheres of disabled readers was severely retarded. On the other hand, Marcel, et al., (1974) felt that the right hemispheres of poor readers were superior to normal readers' right hemispheres in processing linguistic information.

Other studies have shown an apparent preference in right hemispheric functioning by deficient readers. Symmes and Rapoport (1972) reported that all 54 disabled readers, selected from a larger group of reading disabled third graders, scored above average on tests requiring visualization in three dimensions, a right hemisphere mode of processing. Levin (1973) identified two types of disabled readers. One group, weak in decoding skills, performed as well as good readers when asked questions about a pictorial story. Another group, having sufficient decoding skills but lacking organizational strategies, was asked to imagine a picture for each sentence used in a story. This group scored 40% higher

in comprehension than a matched group of disabled readers who were asked to read the story alone. Levin hypothesized that activities requiring visual imagining would aid poor readers' organizational strategies by unconsciously integrating verbal and visual input.

Fadley and Hosler (1979) hypothesized that children with right hemisphere preference experience difficulty with the serial processing of words because they process the word the same way they do a picture. They may initiate eye movements to focus on the most important aspect of the word in order to translate it wholly into imagery meaning as quickly as possible.

Using Visuals to Improve Verbal Learning

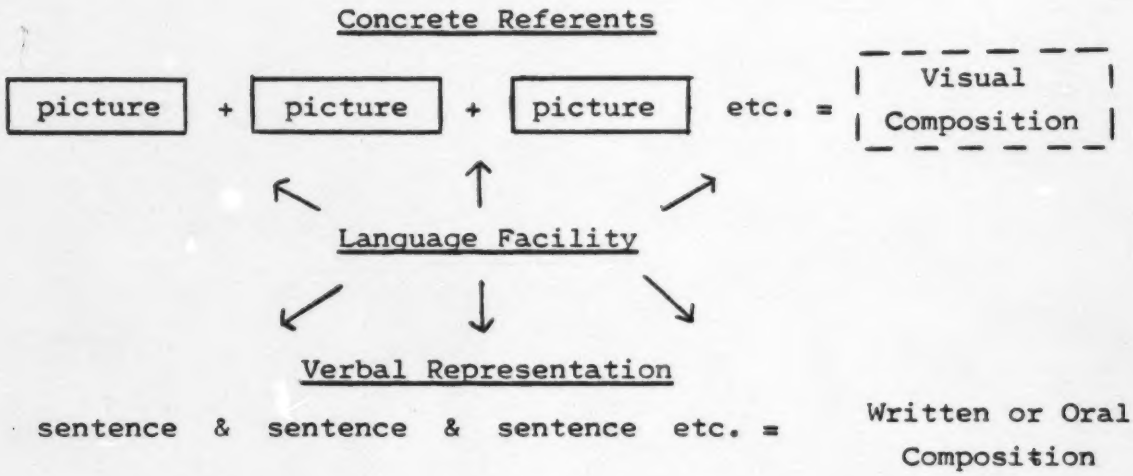
Students with learning difficulties generally associated with the recall and organization of linguistic information may be aided through pictorial stimulation. Suiter and Potter (1978) found that learning disabled children recalled significantly more visual material when pictures were presented in an organized way. They suggested that verbal recall could be facilitated by organizing visual materials in teaching learning disabled children. Haber (1970) suggested that recall might dramatically improve if techniques could be found to attach words to visual images. His subjects could match with 85 to 95% accuracy, 2,560 photographic slides viewed over consecutive days during testing of visual capacity memory. Two children with learning difficulties were described by Debes and Williams (1974). One child wouldn't write themes or essays and the other wouldn't verbally communicate at school. Both were trained to use visual-verbal projects to solve their individual learning problems. The first child, photographed his own visual stories and developed the technique of writing compositions by visualizing the slide pictures he had stored away in his

head. The second student learned to express himself to teachers and classmates through the arrangement of visual stories.

Reading and writing depend on learning to analyze graphic features to interpret the written language code, primarily a left hemisphere mode of processing. Viewing relies on the ability to integrate simultaneously all of the features of the whole, primarily right hemisphere functioning. When sequences of pictures are viewed, both right and left hemispheric processing occurs. The right integrates the meaning of each picture while the left sequences the separate meaning in a coordinated, logical plan. Thus, picture sequences may provide a means of achieving coordination between holistic and analytic processing.

Learning disabilities teachers can arrange visuals to stimulate oral language production, to aid in the recall of written language, and to achieve organizational style in writing. Figure 1. shows how sequences of pictures can infer a completed story - a visualized whole made up of separate components, each supplying a continuous thread of the meaning. Individual pictures will stimulate thinking processes and aid in the retrieval of words and sentences to match the picture meanings. The child composes sentences or sentence fragments dependent on his/her internalized language facility while achieving an organized oral or written whole - the composition.

Figure 1. Use of Visuals to Aid Language Production



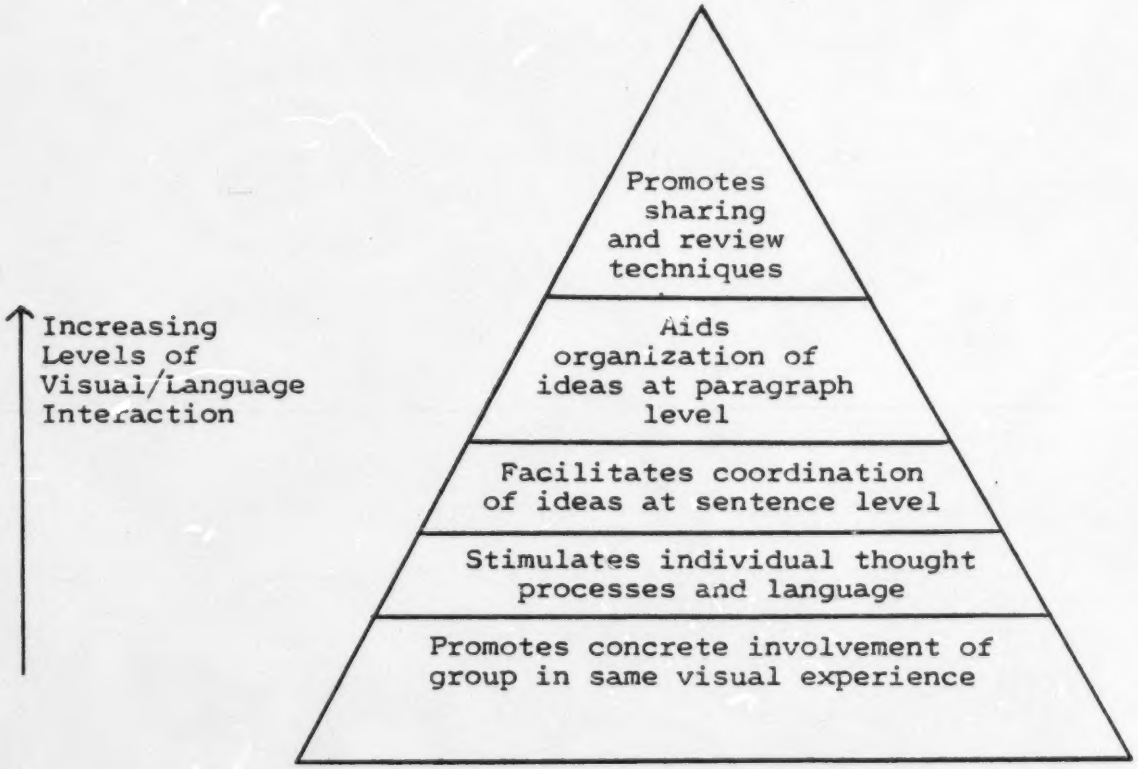
A visual composition is a sequence of pictures that tells or infers a complete story or theme. Any life experience that can be captured in pictures may provide subject matter for a visual story. The objective in structuring a visual composition is to coordinate a series of single pictures so that learning disabled students can use oral and written language to compose logically the story seen in the visual sequence. The visuals provide concrete stimuli to bridge the gap between the idea and the visualization of the idea, strengthening the memory bond between language and experience.

Visual stories can come from any number of sources and they can be structured to model various styles of written discourse (Sinatra, 1975). They can be composed through the technique of photography or they can be abstracted from filmstrips or picture book sources: magazines, brochures, newspapers, advertisements, old books, etc. Some programs teach young

children how to compose their own visual compositions after they review vocabulary words around the activities they plan to photograph (Debes and Williams, 1974).

A key in the use of visual composition sequences is that they provide concrete stimuli for the formation of imagery. Furthermore, the visual base shared by all aids the teacher in using student papers to develop a number of techniques in writing and reading proficiency. Figure 2. shows that a hierarchical level of language involvement is achieved through the use of visual compositions.

Figure 2. Levels of Language Involvement Achieved Through Picture Sequences.


Promotes sharing and review techniques
Aids organization of ideas at paragraph level
Facilitates coordination of ideas at sentence level
Stimulates individual thought processes and language
Promotes concrete involvement of group in same visual experience
Increasing Levels of Visual/Language Interaction

While viewing the picture sequence as a class or group activity, learning disabled children see a unified message unfold before their eyes.

After viewing, each child actively searches his/her memory for words and sentences that match the visual meaning cues. Since a holistic impression of the picture sequence remains in the "mind's eye", the learning disabilities teacher can help each student form a key or main idea sentence that captures the meaning of the whole. Individual sentences or fragments written about single pictures can be coordinated with the main idea sentence to achieve a coherent organized story. Furthermore, word and sentence level mechanical errors that occur with misspelled words, misplaced punctuation, faulty agreement, etc., will be corrected with a clear visual referent in mind. During subsequent reading lessons, students may be stronger at visualizing structural components of paragraphs since they were involved in the organizational processes of writing.

Forming Continuity Between Ideas

An important element in the understanding of organization is the use of linking expressions and connectives between ideas. During initial visual/writing exercises, it is quite helpful to provide students with lists of transitional elements to help them form continuity between sentences as they strive to organize thought. A useful visual device is to prepare a dittoed worksheet containing a series of lined boxes in which students write their sentences. Between each box a chain link or a connecting wire can be drawn. The teacher then asks students to write their transitional words and phrases within the connecting devices to help them visualize the role and function of linking expressions.

Transition words and phrases play an important role in achieving fluency in reading as well. These words appear frequently as sight words (Dale and Chall, 1948), are considered to have a functional role in linking meaning-bearing content words to each other

(Lester et al., 1971), and act as guideposts in nonfoveal vision to advise the brain where to project its next information-gathering fixation during textual reading (Hochberg, 1970). A good English grammar and composition series will describe the functions of prepositions, relative pronouns, and subordinating and coordinating conjunctions and the relationships they express (Warriner et al., 1964).

Visual Compositions and Organizational Styles

Teachers can arrange visuals to achieve three general organizational patterns in writing: sequential, descriptive, and comparative/contrastive. Particular connecting words are appropriate to the organization of each style. The first arrangement involves showing a sequence of pictures that portray an event, contest, adventure, or any process-oriented activity. Two common examples of such visual storylines are the paneled comic strips found in daily and weekend newspapers and the television commercial (Kaplan, 1976). In each of these an action or conflict is often developed and resolved.

If a visual story is shown in which characters are engaged in action or conflict, a narrative writing style will be achieved. The narrative traditionally tells a story and proceeds according to a time sequence or chronology of events. The students themselves can assume the role of main character. In one visual sequence, students were shown slides of an airplane trip that began in the morning and finished at dusk. As they saw the first slide of a stairway leading up to a TWA jumbo jet, they were told to take pen in hand and imagine themselves boarding that plane. Most students wrote in first person narrative and related each aspect of the voyage from their individual points of view.

Another way to influence forward-direction in writing style is to

show students a series of pictures which explains a process or shows how something occurred. The writing style achieved is often that of expository development. In this visual sequence it is important to focus on each step or procedure that leads to a final outcome. In one visual composition, the process involved in constructing a cement block foundation under a porch was illustrated. The step-by-step sequence showed the workmen's preparation of the cement, the procedures for alligning and laying the block, and then the final product - the wall in place under the porch. Students organized their writing accordingly. Since the steps in the building process were clearly portrayed, students were able to achieve smooth coordination between sequential ideas.

Other expository patterns such as cause/effect and problem/solution can also be arranged through visuals. For example, displaying a series of pictures about bad road conditions and then an auto accident would suggest that the bad road conditions caused the accident to occur. After establishing a visual problem by showing a character(s) in a questioning, puzzled attitude, the solution may then be presented in a series of sequential steps.

The following partial list of transitional words and phrases may be used by students in organizing sequentially to indicate time, forward-direction or condition relationships:

(1) Connectives that suggest time relationships:

after	presently	earlier
before	now	finally
next	until	while
meanwhile	during	first, second, third

(2) Connectives that join similar ideas or information:

and	besides	too
more than that	in addition to	of course
furthermore	also	for example
plus	likewise	for instance

(3) Connectives that show cause, purpose, or result:

then	thus	as a result of
so	therefore	finally
because	consequently	to conclude
since	accordingly	for (for this reason)

A second purpose for arranging pictures may be to achieve descriptive writing and spatial organization. The essential feature in this visual arrangement is spatial rather than sequential organization. A short series of pictures showing live or inanimate objects in some kind of organizational arrangement can influence students to position these objects in their writing. The student's viewing perspective could be made to shift along a horizontal plane, as in viewing from left to right; along a vertical plane, as in viewing from bottom to top; or along a distance plane, as in movement from the foreground to the background.

Whichever way the picture movement is planned, students use transition words to organize and connect the descriptive scene. For instance, to achieve connection along a horizontal plane, students were shown a series of slides of a notable rock group at their instruments on the performance stage. Each picture focused on a specific member of the group while visual clues connected each performer to the one on his left and right. The same effect could have been achieved if a large rectangular poster of the performing group were available and each performer were cut out and displayed slightly off to the side of the other. In writing a composition describing the group, students expressed something about the performer in the first picture, linked him to the person in the second picture, and continued coordinating the members of the group across the stage. In presenting the pictures in this way, the teacher influenced the students to think and write in an organized way, relating each performer's position to the next. Students were then aided in forming a

unifying or topic sentence which focused on the group as a whole.

The following list of space relationship words can be used for describing scenes with accuracy and for coordinating objects, characters, and details within scenes:

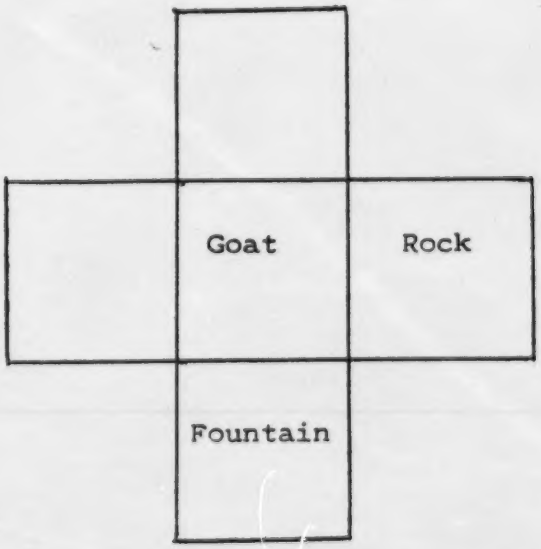
(a) Connectives that indicate horizontal movement:

here	close by	to the left, right
in the middle of	next to	across
at this point	between	to the east, west
in the center of	alongside	this
nearby	beside	that one

(b) Connectives that indicate vertical or distance movement:

above	at the top of	in the distance
below	up from	nearby
under	beyond	at the rear of
beneath	there	in front of
around	away	to the north, south

Brooks used a visual pattern that could be adapted by teachers to help students visualize spatial relations (1970). Brooks placed names of objects into the squares made from a Greek cross. One of the objects was placed in the center square, while two other objects were placed in adjacent arms as in this example:



The resulting spatial relations were always read with respect to the center object, as in this sentence:

"The goat is to the left of the rock and above the fountain."

By changing the position of the "rock" and "fountain" words other sentences would be constructed indicating a change in spatial orientation.

Teachers could structure a very concrete language arts activity by laying pictures within the squares of an enlarged Greek cross. For instance, if the goal were to visualize vertical perspective, the center picture could show a youngster leaning out of a window in an apartment building. A second picture in the arm above would show a person at that window doing something else and a picture below the center would display the antics of a third character at the window below. Students would discuss and describe the second and third characters in relation to the first. Having available space relationship words listed above would aid students in positioning each character in relation to the other.

Once students can describe arrangement and rearrangement of two or three pictures, five pictures relating to one theme could be inserted into the squares. Each student may then be asked to provide an overview sentence of the meaning of the entire theme. This sentence would become the key or topic sentence for that student's written composition. In the subsequent description of the features noted in the pictures contained in the arms, a series of sentences would be generated that indicate a relationship to the overall theme. Once again students could refer to the appropriate lists of transitional elements and organize the theme as various features are described in relation to one another.

A final way to organize visual stories is to arrange sets of

pictures which focus on the similarities or differences between live and inanimate objects. This strategy develops the comparison/contrast technique in writing. Comparing and contrasting can occur in sequential and spatially organized writing. However, it may be quite beneficial to develop it as an organizational technique of its own to make learning disabled students attentive to details and to sharpen their discrimination skills.

Comparing and contrasting are ways in which people think and reason in the contemporary world. People constantly comparison shop and discuss the value of one item in relation to another. Advertisements in magazines or newspapers can become an excellent source for selecting pictures which illustrate the relative merits of one product over another. McQuade (1976) suggested that decisions made by ad writers about promoting a product and convincing an audience to use it are similar to choices students must face in their writing. When students compare and contrast ideas suggested by sets of pictures, they make perceptive decisions about how to communicate choices to others.

In pointing out similarities between items students focus on qualities of sameness. Linking expressions and connectives used in sequential writing can also be used to connect ideas indicating that two items have similar qualities. Since thoughts of a similar nature will be joined, students may be asked to compose one sentence using connectives which join like information.

In developing contrast, students focus on features of difference. Discrimination skills are sharpened as individual features are contrasted with each other. Since contrasting implies knowledge of sameness, it may

be more difficult for children with learning difficulties to discriminate differences between items whose likenesses are not known. Thus, teachers may initially need to discuss the likenesses between pictures before students attempt to point out what makes them different.

Particular transitional words and phrases signal change of thought and indicate that a contrasting idea will follow . Teachers may ask students to initiate the conflicting idea by using one of the following connectives which indicate a change in or a contrast with an idea already presented:

but	although	still
yet	instead	nevertheless
however	otherwise	even though
		in spite of

After working on comparative and contrastive skills separately, a short sequence of pictures may be presented to allow students to alternate styles dependent on the way in which each has interpreted qualities of likeness and difference. For example, students saw a series of seven slides in which seven ski racers negotiated a difficult turn on the side of a hill. Since each racer was photographed from the same camera position, the focus was solely on the skill of each racer. Students were asked to attend to how the racers were alike or different in their execution of the turn. They examined each picture to note particulars of skiing style, mishaps, and expressive facial features. Then some students compared skiiers while other contrasted them in their writing. Neither sequential movement nor spatial organization was emphasized; rather, the ability to note particulars in comparing and contrasting athletic style was highlighted.

In visual composition plans, teaching of writing and reading

skills follows student involvement in the process of using language. Implementing the final level of the plan shown in Figure 2, the teacher plays a major role in stimulating language growth, in aiding writing development, and in strengthening the comprehending process in reading. Once student papers are returned, the following suggestions may be offered as the culminating activity of the visual experience.

1. Have selected students read their papers aloud. Show how these papers captured the organizational style intended by the visual arrangement. Or reshow the entire visual sequence once again pointing out to the group how the arrangement is organized. Use the appropriate connective words in describing the organization. Those who did not achieve an organizational pattern in their writing exercise may sense the organizational pattern now. This learning may be transferred to ensuing reading and writing activities.

2. Have particular student papers projected on the overhead. Since the visual experience is common to all, one student will be better able to visualize how another expressed the same idea, scene, action, or theme. Generate discussion on "how" something was said. Discuss a sentence's appropriateness or lack of it. By using their papers in this way, students strengthen the bond between imagery and language.

3. Have specific sentences read aloud from other papers that captured a meaning or mood from a particular picture. A combination of such creative sentences could form a separate "ideal" paragraph for that sequence.

4. Point out the concreteness or vividness of word choice to describe a particular scene or event. Enrich vocabulary understanding by using words that best describe a scene or action.

5. Develop the use of figurative language to portray a certain meaning. Often, students will use figures of speech since concrete images were fresh in their minds. For instance, one student wrote, "A mountain is like a giant with grey hair," to describe the Matterhorn. The use of metaphors and imagery also encourage right brain processing (Fox, 1979).

6. Concentrate on the transition between pictures and how specific students used connectives appropriately to link ideas.

7. Work on sentence construction by illustrating how students may combine ideas from several pictures to form one sentence. From combining visuals, students learn to combine sentences. Research has shown that sentence-combining practice aids reading comprehension and writing maturity (Combs, 1977).

8. Finally, devote time to the reading of the same style from other sources. Select paragraphs that illustrate the style of writing students have just completed in the visual/writing exercise. Since each student has seen visual organization of that discourse, she/he may be able to perceive this structure more readily in reading experiences. Understanding the internal structure of written organization strengthens the comprehending process (Herber, 1970).

Conclusion

The visual strategies suggested in this paper stimulate right-brain hemispheric input while aiding verbal production of children deficient in language skills. Picture stories can provide concrete stimuli to assist these children in the visualization of ideas. As Fox suggested (1979), when teachers stimulate right-brain processing through the use of pictures and the encouragement of mental imagining, recall and comprehension improve since children learn to construct pictorial frameworks for new words, concepts, and stories. Furthermore, the learning disabilities teacher can capitalize on the common visual base shared by all and the composing process in which each participated. Visual-verbal connections strengthen language recall and organizational style. Students can be taught to organize three major patterns in writing: narration, description, and comparison/contrast and to use the linking expressions that connect ideas in each pattern. Through visuals, learning disabled children are provided concrete opportunities to capture life experiences in words.

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